

Appl. No. : 10/645,981
Filed : August 22, 2003

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows. Please cancel Claim 16 without prejudice.

1. (Currently amended) A plurality of magnetic memory cells, comprising:
a first pinned magnetic layer shared by the plurality of magnetic memory cells, wherein the pinned magnetic layer comprises a plurality of domain wall traps formed at predetermined intervals between the magnetic memory cells; and
a plurality of second magnetic layers, each of which corresponds to a separate one of the plurality of magnetic memory cells[[:]].
~~wherein the first magnetic layer comprises a plurality of domain wall traps formed at predetermined intervals between the magnetic memory cells.~~
2. (Currently amended) ~~The plurality of magnetic memory cells of Claim 1,~~ A plurality of magnetic memory cells, comprising:
a first magnetic layer shared by the plurality of magnetic memory cells; and
a plurality of second magnetic layers, each of which corresponds to a separate one of the plurality of magnetic memory cells;
wherein the first magnetic layer comprises a plurality of domain wall traps formed at predetermined intervals between the magnetic memory cells, wherein the domain wall traps comprise regions of the first magnetic layer having a narrower width than the remainder of the first magnetic layer.
3. (Original) The plurality of magnetic memory cells of Claim 2, wherein the width of the narrow regions of the first magnetic layer falls within the range of about 25 % to about 85 % of the width of the remainder of the first magnetic layer.
4. (Original) The plurality of magnetic memory cells of Claim 2, wherein the narrow regions of the first magnetic layer are created by forming notches along only a single side of the first magnetic layer.
5. (Original) The plurality of magnetic memory cells of Claim 1, wherein a domain wall trap is formed between each pair of consecutive magnetic memory cells.

Appl. No. : 10/645,981
Filed : August 22, 2003

6. (Original) The plurality of magnetic memory cells of Claim 1, wherein multiple magnetic memory cells are formed between each pair of consecutive domain wall traps.

7. (Currently amended) The plurality of magnetic memory cells of Claim 1, wherein the ~~first pinned~~ magnetic layer comprises a plurality of sublayers comprising tantalum, nickel-iron, magnesium oxide, ~~iridium-manganese~~ iridium-manganese, platinum-manganese, ~~nickel-manganese~~ nickel-manganese, and/or cobalt-iron.

8. (Original) The plurality of magnetic memory cells of Claim 1, wherein the second magnetic layers comprise a plurality of sublayers comprising tantalum, tungsten nitride, nickel-iron, cobalt, and/or copper.

9. (Original) The plurality of magnetic memory cells of Claim 1, wherein the magnetic memory cells comprise tunneling magnetoresistance (TMR) memory cells.

10. (Currently amended) The plurality of magnetic memory cells of Claim 9, further comprising one or more barrier layers located between the ~~first pinned~~ magnetic layer and the plurality of second magnetic layers within the plurality of magnetic memory cells.

11. (Original) The plurality of magnetic memory cells of Claim 10, wherein the one or more barrier layers comprise aluminum oxide.

12. (Withdrawn) The plurality of magnetic memory cells of Claim 1, wherein the magnetic memory cells comprise giant magnetoresistance (GMR) memory cells.

13. (Currently amended) An MRAM device comprising:

~~a magnetic layer common to a plurality of magnetic memory cells[[,]] ; and~~

~~wherein the~~ a pinned magnetic layer common to the plurality of magnetic memory cells, wherein the pinned magnetic layer is configured to prevent the formation of locate a magnetic domain wall between memory cells, rather than within a region of the pinned magnetic layer corresponding to a given memory cell.

14. (Currently amended) ~~The MRAM device of Claim 13,~~ An MRAM device comprising:

a magnetic layer common to a plurality of magnetic memory cells; and

wherein the magnetic layer is configured to prevent the formation of a magnetic domain wall within a region of the magnetic layer corresponding to a given memory cell,

Appl. No. : 10/645,981
Filed : August 22, 2003

wherein the width of the magnetic layer narrows at predetermined intervals along the length of the magnetic layer.

15. (Original) The MRAM device of Claim 14, wherein the width of the narrow portions of the magnetic layer falls within the range of about 25 % to about 85 % of the width of the remainder of the magnetic layer.

16. (Canceled)

17. (Currently amended) The MRAM device of Claim 13, wherein the magnetic layer comprises a plurality of sublayers comprising tantalum, nickel-iron, magnesium oxide, ~~iridium-manganese~~ iridium-manganese, platinum-manganese, ~~nickel-manganese~~ nickel-manganese, and/or cobalt-iron.

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (New) An apparatus comprising:

a plurality of magnetic memory cells having a shared pinned layer; and
means for holding in place domain walls of the shared pinned layer.

23. (New) The apparatus as defined in Claim 22, wherein the holding means comprises one or more notches defined in the shared pinned layer between at least a first memory cell and a second memory cell.